UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,662	12/27/2001	Jaime Hasson	P-4659-US	6998

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EXAMINER
WANG, TED M

ART UNIT	PAPER NUMBER
2634	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	**Applicant(s)**
Office Action Summary	10/026,662	HASSON, JAIME
	Examiner	**Art Unit**	
	Ted M. Wang	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2005*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3,4,15-19,21 and 24* is/are allowed.

6)☒ Claim(s) *1,2 and 5-14* is/are rejected.

7)☒ Claim(s) *20,22 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, filed on 12/19/2005, with respect to the rejection of claims

3,4, under 35 USC103(a) has been fully considered and are persuasive. Therefore, the

rejection has been withdrawn.

2.   Applicant's arguments, filed on 12/19/2005, with respect to the rejection of claims

1, 2, and 5-14 under 35 USC103(a) has been fully considered but they are not

persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly

believes that the cited reference to reasonably and properly meet the claimed

limitations.

Independent Claims 1, 5, and 10

(1) *Applicants' argument –*

a) "Claim 1 requires, "Applicant respectfully submits that Steensgard-Madsen

does not describe, teach or suggest any type of polar quantizer, and specifically

does not teach or fairly suggest a non-uniform polar quantizer, as required by

claim 1... Applicant farther submits that delta-sigma modulator 226, as described

by Steensgard-Madsen, includes a "non-uniform" loop quantizer 236 to improve

dynamic-range performance. As shown in Fig. 27, loop quantizer 236 has a small

step size in the midrange. The step size is increased near the boundaries of the

resolving range (Column 21, lines 49-62). Thus, Applicant respectfully submits

that the term "non-uniform" is used by Steensgard- Madsen merely to describe

the non-uniform step size of loop quantizer 236. Accordingly, quantizer 236, as

described by Steensgard-Madsen does not include a polar quantizer."

Examiner's response – In response to applicant's argument as recited in the

above paragraph that as admitted by the applicant, Steensgard-Madsen teaches

a delta-sigma modulator 226 including a "non-uniform" loop quantizer 236 to

improve dynamic-range performance. This non-uniform loop quantizer can be

implement into Underbrink's delta-sigma modulator (Fig.10 element 1000,

column 9 lines 11-23, where N =2, 4, ..) in order to improve dynamic-range

performance as addressed in the previous Non-final Office Action # 20050927,

dated 9/29/2005.

The instant applicant argued that Underbrink et al. and Steensgard-

Madsen et al. do not teach *a non-uniform polar quantizer*. The examiner notices

that the specification of the instant application has nowhere teaching a structure

of *the non-uniform polar quantizer*. Instead, it shows *the results of the non-*

uniform polar quantizer (Fig.3 and 4) with respect to a QPSK and 8-PSK

modulated signal, respectively. The examiner further response that *the non-*

uniform polar quantizer is nothing but a *non-uniform quantizer* that is capable of

non-uniformly quantizing a complex input (I & Q) with respect to a QPSK or 8-

PSK modulated signal. Thus, the modified M phase (MPSK) delta-sigma

modulator with non-uniform quantizer as taught by Underbrink et al. and

Steensgard-Madsen et al. will give the *polar representation* output for each

individual symbol (Fig. 6, 8, 10, and column 7 line 41 – column 10 line 4).

Therefore, for the explanation addressed in the above paragraph, the

rejection under 35 U.S.C. 103(a) with Underbrink et al. and Steensgard-

Madsens' references are adequate.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

4.   Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Underbrink et al. (US 6,754,287) in view of Steensgaard-Madsen (US 6,271,782).

❑   With regard claim 1, Underbrink et al. discloses a portable communication device

comprising:

a sigma-delta N-phase shift keying modulator (Fig.10 element 1000, column 9

lines 11-23, where N =2, 4, ..). It is well known in the art that the Phase Shift

Keying (PSK) is a polar method for modulating a carrier signal with a data signal

(column 7 lines 41-42). For example, in QPSK (N=4), as shown in Underbrinks'

reference, a phase shift of 45.degree., i.e. vector 800, represents bit pair 00, a

phase shift of 135.degree., i.e. vector 802, represents bit pair 00, a phase shift of

255.degree., i.e. vector 804, represents bit pair 11, and a phase shift of

315.degree., i.e. vector 806, represents bit pair 01. These pairs of bits are

commonly referred to as dibits or symbols. In general, distinct information states

of PSK signals are commonly referred to as symbols. A symbol may be larger

than a dibit and may contain several bits of information. In general, the phase

signal is represented as a vector rotating in the I/Q plane with the length of the

vector representing the amplitude of the signal. Separating a signal into I and Q

representation facilitates decomposition of the signal into amplitude and phase

components, that may then be used to produce a broadcast signal. For a QPSK

as seeing in the Fig.8, the symbols completely covering the complex plan in a

non-overlapping manner.

Underbrink et al. discloses all of the subject matter as described in the above

paragraph except for specifically teaching the sigma-delta N-phase shift keying

modulator having a non-uniform polar quantizer.

However, Steensgaard-Madsen teaches a sigma-delta modulator having a non-

uniform polar quantizer (Fig.24 element 228, Fig.27, and column 21 lines 48-67).

It is desirable to have a sigma-delta modulator having a non-uniform polar

quantizer. The reason for this is that, in general, the dynamic-range performance

is generally more important than the peak-signal-to-noise ratio performance. A

nonuniform loop quantizer can be used to improve the dynamic-range

performance. The loop quantizer's step size should be small in the midrange,

such that the quantization-noise performance is good for small input signals. The

step size is increased near the boundaries of the resolving range, such that the

modulator will remain stable if large input signals should leak through to the loop

quantizer. Using this technique, the loop quantizer can be simplified greatly

without deteriorating the overall performance noticeably, and/or the modulator's

stability be enhanced (column 21 lines 48-67). Therefore, It would have been

obvious to one of ordinary skill in the art at the time of the invention was made to

include the apparatus/method as taught by Steensgaard-Madsen in which having

a sigma-delta modulator having a non-uniform polar quantizer, into Underbrinks'

Sigma-Delta modulator circuitry so as to improve dynamic-range performance so

that the modulator's stability is enhanced.

 □ With regard claim 2, Underbrink et al. further discloses wherein said N is selected

    from a group including: 2, 4, 8, 16, and 32 (column 7 line 41 – column 8 line 8).

5.   Claims 5, 9, 10, and 14 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Underbrink et al. (US 6,754,287) and Steensgaard-Madsen (US

6,271,782) as applied to claim 1 above, and further in view of Dent et al. (US

6,181,920).

 □ With regard claim 5, Underbrink et al. further discloses an antenna (Fig.2

    element 211).

    Underbrink et al. and Steensgaard-Madsen discloses all of the subject matter as

    described in the above paragraph except for specifically teaching the antenna is

    a dipole antenna.

    However, Dent et al. teaches a dipole antenna (column 4 lines 3-12).

    It is desirable to have a dipole antenna in the transmitter. The reason for this is

    that the dipole antenna is simply a two-wire transmission line so the size of the

antenna could be very small, and the size reduction will allow the antenna to be

hidden in the radio package for many applications so that the cost reduction can

be achieved. Therefore, It would have been obvious to one of ordinary skill in the

art at the time of the invention was made to include the apparatus/method as

taught by Dent et al. in which having a dipole antenna in the transmitter, into

Underbrink et al. and Steensgaard-Madsens' transmitter in order to reduce the

size of the antenna so that the transmitter cost can be reduced.

❑ With regard claim 9, which is a device claim related to claims 2 and 5, all

limitation is contained in claims 2 and 5. The explanation of all the limitation is

already addressed in the above paragraph.

❑ With regard claim 10, which is a mobile phone claim related to claim 5, all

limitation is contained in claim 5. The explanation of all the limitation is already

addressed in the above paragraph.

❑ With regard claim 14, which is a mobile phone claim related to claims 9 and 10,

all limitation is contained in claims 9 and 10. The explanation of all the limitation

is already addressed in the above paragraph.

6.   Claims 6, 7, 11, and 12 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Underbrink et al. (US 6,754,287) and Steensgaard-Madsen (US

6,271,782) and Dent et al. (US 6,181,920) as applied to claim 5 above, and further in

view of McCune (US 6,636,112).

❑ With regard claims 6 and 7, Underbrink et al. further discloses a Power Amplifier

(Fig.2 element 209).

Underbrink et al. and Steensgaard-Madsen and Dent et al. disclose all of the

subject matter as described in the above paragraph except for specifically

teaching the power amplifier is a switching power amplifier/Class-E amplifier.

However, McCune teaches a switching power amplifier/Class-E amplifier (column

2 lines 8-36) in order to reduce the power amplifier switching loss so that the

power amplifier power efficient is improved.

Therefore, It would have been obvious to one of ordinary skill in the art at the

time of the invention was made to include the apparatus as taught by McCune in

which having a switching power amplifier/Class-E amplifier, into Underbrink et al.

and Steensgaard-Madsen and Dents' modified transmitter so as to reduce the

power amplifier switching loss so that the power amplifier power efficient is

improved.

- ❑ With regard claim 11, which is a mobile phone claim related to claim 6, all

  limitation is contained in claim 6. The explanation of all the limitation is already

  addressed in the above paragraph.

- ❑ With regard claim 12, which is a mobile phone claim related to claim 7, all

  limitation is contained in claim 7. The explanation of all the limitation is already

  addressed in the above paragraph.

7.   Claims 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Underbrink et al. (US 6,754,287) and Steensgaard-Madsen (US 6,271,782) and Dent et

al. (US 6,181,920) and McCune (US 6,636,112) as applied to claim 6 above, and further

in view of Oursler (US 4,063,199).

▢ With regard claim 8, Underbrink et al. and Steensgaard-Madsen and Dent et al.

and McCune disclose all of the subject matter as described in the above

paragraph except for specifically teaching a bandpass filter coupled to output of

said switching amplifier and coupled to said dipole antenna.

However, Oursler teaches that a bandpass filter coupled to output of said

switching amplifier and coupled to an antenna (Fig.1 element 30 and column 4

line 51 – column 5 line 8).

It is desirable to have a bandpass filter coupled to output of said switching

amplifier and coupled to a antenna. The reason for this is that network 30

provides the proper bandpass filter of the rectangular waveform so as to remove

the unwanted modulation products and the undesirable higher frequency

harmonics of the carrier frequency so that the transmission signal quality is

improved (column 4 line 64 – column 5 line 8). Therefore, It would have been

obvious to one of ordinary skill in the art at the time of the invention was made to

include the apparatus/method as taught by Oursler in which having a bandpass

filter coupled to output of said switching amplifier and coupled to said dipole

antenna, into Underbrink et al. and Steensgaard-Madsen and Dent et al. and

McCunes' modified transmitter system so as to remove the unwanted modulation

products and the undesirable higher frequency harmonics of the carrier

frequency so that the transmission signal quality is improved.

□   With regard claim 13, which is a mobile phone claim related to claim 8, all

limitation is contained in claim 8. The explanation of all the limitation is already

addressed in the above paragraph.

Allowable Subject Matter

8.   Claims 3, 4, 15-19, 21, and 24 are allowed.

9.   Claims 20, 22, and 23 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

Conclusion

10.   Reference "Parallelism exploitation in SAR dfata compression methods", Beatriz

Botero, Nourredine Hifdi, EUSAR 2000, Munich, Allemagne, 23-25 May 2000 is cited

because they are put pertinent to the non-uniform polar quantizer, none of references

teach detailed connection as recited in claim.

11.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

12.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

13.   A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang
Examiner
Art Unit 2634

Ted M. Wang

KEVIN BURD
PRIMARY EXAMINER